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09/880,707	06/12/2001	Daniel Yellin	10559-449001 / P10766	5530

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EXAMINER
TORRES, JOSEPH D

ART UNIT	PAPER NUMBER
2133	

DATE MAILED: 06/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>21 April 2006</u>.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-22 and 29-31</u> is/are pending in the application.

    4a) Of the above claim(s) <u>29-31</u> is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-6, 9-13, 16-19 and 22</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>14 January 2002</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the·International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1.   Newly submitted claims 29-31 directed to an invention that is independent or

distinct from the invention originally claimed for the following reasons: claim 29 is

directed to SISO decoding properly classified in 714/795. Claims 30 and 31 are

directed to a communication system including an encoder and decoder properly

classified in 714/776.   ·

Since applicant has received an action on the merits for the originally presented

invention, this invention has been constructively elected by original presentation for

prosecution on the merits. Accordingly, claims 29-31 withdrawn from consideration as

being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Claims 29-31 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as

being drawn to a nonelected invention, there being no allowable generic or linking claim.

This application contains claims 29-31 drawn to an invention nonelected with traverse.

A complete reply to the final rejection must include cancellation of nonelected claims or

other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Response to Arguments

2.   Applicant's arguments filed 04/21/2006 have been fully considered but they are

not persuasive.

The Examiner begins by summarizing the Examiner's previous arguments as it pertains

to the Applicant's current response:

Figure 11D in Kobayashi teaches that output from Decoder D_3 and De-interleaver π_{23}^{-1} is

supplied to AZD_2. Decoder D_3 and De-interleaver π_{23}^{-1} is are constituent decoding

elements in the iterative decoding process of Figure 11D. The output of Decoder D_3

and De-interleaver π_{23}^{-1} is de-interleaved decoded soft output that approximates the

actual digital D_3 decoded and π_{23}^{-1} de-interleaved data. AZD_2 is used to modify the

approximation of the π_{23}^{-1} de-interleaved D_3 decoded soft output from Decoder D_3 and

De-interleaver π_{23}^{-1} by using a finer or coarser quantization for soft data being used. The

output of AZD_2 is refined soft data approximating actual digital D_3 decoded and de-

interleaved data. Figure 9A and 9B substantially teach a look-up method for translating

input values of an AZD into output values; hence an AZD is a look-up process storing

discrete output values to which a range of input values are mapped.

Kobayashi explicitly teaches <decoding the encoded packet input to the Decoder of

Figure 11D using an AZD look-up table that stores the output value information of

Figures 9A and 9B in Kobayashi approximating actual digital D_3 decoded and π_{23}^{-1} de-

interleaved output of the Decoder D_3 and De-interleaver π_{23}^{-1} algorithmic decoding

process> (Note: the second limitation of the Applicant's claim 1 recites, "decoding the

encoded packet using a look-up table that stores information approximating output of

the algorithmic decoding process"; hence only the underlined elements in the phrase

included in <> brackets differs from the Applicant's claim 1).

The Applicant contends, "regardless of how the Kobayashi et al. patent is intepreted,

that patent simply does not disclose decoding an encoded packet using a look-up table

that stores information approximating output of an algorithmic decoding process, as is

recited in claim 1".

The Examiner disagrees and asserts that Figure 11D in Kobayashi teaches that output

from Decoder D_3 and De-interleaver π_{23}^{-1} is supplied to AZD_2. Decoder D_3 and De-

interleaver π_{23}^{-1} is are constituent decoding elements in the iterative decoding process of

Figure 11D. The output of Decoder D_3 and De-interleaver π_{23}^{-1} is de-interleaved

decoded soft output that approximates the actual digital D_3 decoded and π_{23}^{-1} de-

interleaved data. AZD_2 is used to modify the approximation of the π_{23}^{-1} de-interleaved

D_3 decoded soft output from Decoder D_3 and De-interleaver π_{23}^{-1} by using a finer or

coarser quantization for soft data being used. The output of AZD_2 is refined soft data

approximating actual digital D_3 decoded and de-interleaved data. Figure 9A and 9B

substantially teach a look-up method for translating input values of an AZD into output

values; hence an AZD is a look-up process storing discrete output values to which a

range of input values are mapped. Hence; Kobayashi explicitly teaches <decoding the

encoded packet input to the Decoder of Figure 11D using an AZD look-up table that

stores the output value information of Figures 9A and 9B in Kobayashi approximating

actual digital D$_3$ decoded and π_{23}^{-1} de-interleaved output of the Decoder D$_3$ and De-

interleaver π_{23}^{-1} algorithmic decoding process> (Note: the second limitation of the

Applicant's claim 1 recites, "decoding the encoded packet using a look-up table that

stores information approximating output of the algorithmic decoding process"; hence

only the underlined elements in the phrase included in <> brackets differs from the

Applicant's claim 1). That is, Kobayashi word-for-word teaches, "decoding the encoded

packet using a look-up table that stores information approximating output of the

algorithmic decoding process".

The Applicant contends, "The advisory action's interpretation of the Kobayashi et al.

patent also is incorrect because the AZD in FIG. 14B of the Kobayashi et al. patent

does not approximately reverse the effect of the random errors that are induced in the

signal that is transmitted over the channel of FIG. 14A".

In response to applicant's argument that the references fail to show certain features of

applicant's invention, it is noted that the features upon which applicant relies (i.e., "does

not approximately reverse the effect of the random errors that are induced in the signal")

are not recited in the rejected claim(s). Although the claims are interpreted in light of

the specification, limitations from the specification are not read into the claims. See *In*

re Van Geuns, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

The Applicant contends, "Instead, the AZD merely assigns "erasure symbols" to the

ambiguous data"."

The Examiner disagrees and asserts that erasure values in Figures 9A and 9B in

Kobayashi are soft values indicating the proximity of π_{23}^{-1} de-interleaved D_3 decoded soft

output to actual digital D_3 decoded and π_{23}^{-1} de-interleaved data. For example, 'e' in

Figure 9B indicates that the received value is ambiguous but that it is closer to 0 than 2

and 'f' in Figure 9B indicates that the received value is ambiguous but that it is closer to

2 than 0. Merriam-Webster's Collegiate Dictionary defines approximation as a

mathematical quantity that is close in value to but not the same as a desired quantity.

Kobayashi teaches 'e' in Figure 9B is close in value to 0 or 1 but is not the same value

as 0 or 1 whereas 'f' is close in value to 1 or 2 but is not the same value as 1 or 2.

Kobayashi teaches that providing the additional proximity information in the erasure

symbols improves decoding. Furthermore; an output sequence from the AZD_2 unit in

Figure 11D is off from the actual D_3 decoded and π_{23}^{-1} de-interleaved data by only the

erasure values; hence any output sequence from the AZD_2 unit is an approximation.

For example; if the AZD_2 unit produces the following output sequence [110e10202111f],

the output sequence is only off from the actual D_3 decoded and π_{23}^{-1} de-interleaved data

by only the erasure values and hence is an explicit approximation of the actual D_3

decoded and π_{23}^{-1} de-interleaved data [110a10202111b], where a and b are the actual

values of the output sequence.

The Applicant contends, "As applicants best understand the Examiner's position: 1) the

noiseless transmission of data across the channel of FIG. 14A somehow is considered

encoding the data, and 2) the AZD'S processing of the noise-free data it receives

somehow is considered decoding the data. That is incorrect. Even if the noise induced

by the..."

The Examiner clarifies. 'Figure 11D in Kobayashi teaches that output from Decoder D_3

and De-interleaver π_{23}^{-1} is supplied to AZD_2. Decoder D_3 and De-interleaver π_{23}^{-1} are

constituent decoding elements in the iterative decoding process of Figure 11D. The

output of Decoder D_3 and De-interleaver π_{23}^{-1} is de-interleaved decoded soft output that

approximates the actual digital D_3 decoded and π_{23}^{-1} de-interleaved data. AZD_2 is used

to modify the approximation of the π_{23}^{-1} de-interleaved D_3 decoded soft output from

Decoder D_3 and De-interleaver π_{23}^{-1} by using a finer or coarser quantization for soft data

being used. The output of AZD_2 is refined soft data approximating actual digital D_3

decoded and de-interleaved data. Figure 9A and 9B substantially teach a look-up

method for translating input values of an *AZD* into output values; hence an *AZD* is a

look-up process storing discrete output values to which a range of input values are

mapped. Hence; Kobayashi explicitly teaches <decoding the encoded packet input to

the Decoder of Figure 11D using an *AZD* look-up table that stores the output value

information of Figures 9A and 9B in Kobayashi approximating actual digital D_3 decoded

and π_{23}^{-1} de-interleaved output of the Decoder D_3 and De-interleaver π_{23}^{-1} algorithmic

decoding process> (Note: the second limitation of the Applicant's claim 1 recites,

"decoding the encoded packet using a look-up table that stores information

approximating output of the algorithmic decoding process"; hence only the underlined

.

elements in the phrase included in <> brackets differs from the Applicant's claim 1).

That is, Kobayashi word-for-word teaches, "decoding the encoded packet using a look-

up table that stores information approximating output of the algorithmic decoding

process".

The Applicant contends, "In particular, the input/output characteristics of the AZD (see

FIG. 9B) does not approximate an algorithmic decoding process. Instead, the

input/output characteristics merely assign a non-numeric value (i.e., "e" or "f ") to certain

ambiguous data". That is incorrect. Kobayashi explicitly teaches <decoding the

encoded packet input to the Decoder of Figure 11D using an AZD look-up table that

stores the output value information of Figures 9A and 9B in Kobayashi approximating

actual digital D_3 decoded and π_{23}^{-1} de-interleaved output of the Decoder D_3 and De-

interleaver π_{23}^{-1} algorithmic decoding process> (Note: the second limitation of the

Applicant's claim 1 recites, "decoding the encoded packet using a look-up table that

stores information approximating output of the algorithmic decoding process"; hence

only the underlined elements in the phrase included in <> brackets differs from the

Applicant's claim 1). That is, Kobayashi word-for-word teaches, "decoding the encoded

packet using a look-up table that stores information approximating output of the

algorithmic decoding process".   In addition, Kobayashi teaches 'e' in Figure 9B is close

in value to 0 or 1 but is not the same value as 0 or 1 whereas 'f' is close in value to 1 or

2 but is not the same value as 1 or 2. Kobayashi teaches that providing the additional

proximity information in the erasure symbols improves decoding. Furthermore; an

output sequence from the AZD_2 unit in Figure 11D is off from the actual D_3 decoded and

π_{23}^{-1} de-interleaved data by only the erasure values; hence any output sequence from the

AZD_2 unit is an approximation. For example; if the AZD_2 unit produces the following

output sequence [110e102021111f], the output sequence is only off from the actual D_3

decoded and π_{23}^{-1} de-interleaved data by only the erasure values and hence is an explicit

approximation of the actual D_3 decoded and π_{23}^{-1} de-interleaved data [110a10202111b],

where a and b are the actual values of the output sequence.

The Applicant contends, "The AZD does not approximate a procedure for solving a

mathematical problem in a finite number of steps that frequently involves repetition of an

operation".

The Examiner asserts that the Applicant's claim 1 recites, "decoding the encoded

packet using a look-up table that stores information approximating output of the

algorithmic decoding process", that is, the Applicant's own claim language only recites

using a look-up table that stores information approximating **output** of the algorithmic

decoding process. Nowhere does the Applicant claim a look-up table "for solving a

mathematical problem in a finite number of steps".

In response to applicant's argument that the references fail to show certain features of

applicant's invention, it is noted that the features upon which applicant relies (i.e., a

look-up table that stores information approximating output of the algorithmic decoding

process) are not recited in the rejected claim(s). Although the claims are interpreted in

light of the specification, limitations from the specification are not read into the claims.

See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

The Examiner asserts that AZD_2 output does approximate the actual digital D3 decoded

and π_{23}^{-1} de-interleaved **output** of the Decoder D3 and De-interleaver π_{23}^{-1} of the Decoder

D3 and De-interleaver π_{23}^{-1} procedure for solving the mathematical problem of decoding

in a finite number of steps (see previous arguments for details). For example; if the

AZD_2 unit produces the following output sequence [110e10202111f], the output

sequence is only off from the actual D3 decoded and π_{23}^{-1} de-interleaved data by only the

erasure values and hence is an explicit approximation of the actual D3 decoded and

π_{23}^{-1} de-interleaved data [110a10202111b], where a and b are the actual values of the

output sequence.

The Applicant contends, "AZD2 does not store information that approximates an

algorithmic decoding process of the encoder E3".

The Examiner asserts that the Applicant's claim 1 recites, "decoding the encoded

packet using a look-up table that stores information approximating output of the

algorithmic decoding process", that is, the Applicant's own claim language only recites

using a look-up table that stores information approximating **output** of the algorithmic

decoding process. Nowhere does the Applicant claim a look-up table "for solving a

mathematical problem in a finite number of steps".

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., a look-up table that stores information approximating output of the algorithmic decoding process) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

The Examiner asserts that AZD_2 output does approximate the actual digital D_3 decoded and π_{23}^{-1} de-interleaved **output** of the Decoder D_3 and De-interleaver π_{23}^{-1} of the Decoder D_3 and De-interleaver π_{23}^{-1} procedure for solving the mathematical problem of decoding in a finite number of steps (see previous arguments for details). For example; if the AZD_2 unit produces the following output sequence [110e10202111f], the output sequence is only off from the actual D_3 decoded and π_{23}^{-1} de-interleaved data by only the erasure values and hence is an explicit approximation of the actual D_3 decoded and π_{23}^{-1} de-interleaved data [110a10202111b], where a and b are the actual values of the output sequence.

The Applicant contends, "There is no disclosure or suggestion in the Kobayashi patent of a look-up table that stores an approximation of a soft-input soft-output, soft-input hard-output, hard-input soft-input or hard-input hard-output algorithmic decoding process".

Quantized data is soft data. The AZDs in Kobayashi are configured to provide soft

information to decoders expecting soft information and that also produce soft

information for subsequent use. Decoder D_3 in Figure 11D is a soft-input/ soft output

device. Further, any decoder has to fall into one of the categories provided by claim 5,

that is, any decoder satisfies claim 5 and claim 5 is equivalent to saying any decoder.

The Examiner disagrees with the applicant and maintains all rejections of claims 1-6, 9-

13, 16-19 and 22. All amendments and arguments by the applicant have been

considered. It is the Examiner's conclusion that claims 1-6, 9-13, 16-19 and 22 are not

patentably distinct or non-obvious over the prior art of record in view of the references,

Kobayashi; Hisashi et al. (US 6029264 A, hereafter referred to as Kobayashi) in view of

Steele; Raymond (US 4393276 A) as applied in the last office action, filed 11/16/2005.

Therefore, the rejection is maintained.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

       1.   Determining the scope and contents of the prior art.

       2.   Ascertaining the differences between the prior art and the claims at issue.

       3.   Resolving the level of ordinary skill in the pertinent art.

       4.   Considering objective evidence present in the application indicating obviousness or nonobviousness.

3.   Claims 1-6, 9-13, 16-19 and 22 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Kobayashi; Hisashi et al. (US 6029264 A, hereafter referred to as

Kobayashi) in view of Steele; Raymond (US 4393276 A).

See the Final Action filed 11/16/2005 for detailed action of prior rejections.

Allowable Subject Matter

4.   Claims 7, 8, 14, 15, 20 and 21 are objected to as being dependent upon a

rejected base claim, but would be allowable if rewritten in independent form including all

of the limitations of the base claim and any intervening claims.

Conclusion

5.   This is a RCE of applicant's earlier Application. All claims are drawn to the same

invention claimed in the earlier application and could have been finally rejected on the

grounds and art of record in the next Office action if they had been entered in the earlier

application. Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first action

in this case. See MPEP § 706.07(b). Applicant is reminded of the extension of time

policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no, however, event will the statutory period for reply expire later

than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Joseph D. Torres whose telephone number is (571)

272-3829. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Albert Decady can be reached on (571) 272-3819. The fax phone number

for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published

applications may be obtained from either Private PAIR or Public PAIR. Status

information for unpublished applications is available through Private PAIR only. For

more information about the PAIR system, see http://pair-direct.uspto.gov. Should you

have questions on access to the Private PAIR system, contact the Electronic Business

Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO

Customer Service Representative or access to the automated information system, call

800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Joseph D. Torres, PhD
Primary Examiner
Art Unit 2133